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Turbiditic systems on passive margins: fifteen years of fruitful industry-academic exchanges.

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During the last fifteen years, with the oil discovery in deep offshore plays, new tools have been developed that deeply modified our knowledge on sedimentary gravity processes on passive margins: geometry, physical processes, but also the importance of the topography and the quantification of the stratigraphic parameters of control. The major breakthrough was of course the extensive 3D seismic data available around most of the world margins with a focus on gravity-tectonics dominated margins.
The first major progress was the characterization of the sinuous channels infilling, their diversity and different models for their origin. This also was a better knowledge of the different types of slopes (graded vs. above-graded) and the extension of the concept of accommodation to deep-water environments (ponded, healed-slope, incised submarine valley and slope accommodation).
The second step was the understanding of the synsedimentary deformations for the location and the growth of turbiditic systems on margins dominated by gravity tectonics, with the importance of the sedimentary flux and its variation through time and space.
The third step is now the integration of the sedimentary system, from the upstream erosional catchment to the abyssal plain (source to sink approach), with the question of the sediment routing system. During the last 100 Ma, continents experienced major changes of both topography and climate. In the case of Africa, those are (1) the growth of the plateaus (and mainly the South African one) around 90-80 Ma (Late Cretaceous) and 40-20 Ma (Late Eocene-Early Miocene) and (2) a climate evolution from hot humid (50-40 Ma) to hot dry conditions since 20-15 Ma. This evolution changed the topography, the processes of erosion and the volume and nature (weathered vs. non weathered rocks) materials. Those are primary processes for controlling the deposition of turbiditic systems, and then to predict the location of sands. This will be discussed along the Atlantic margin of Africa.

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